

Claims

1. A catalyst composition comprising: a substrate and ultrafine particles.
2. The catalyst composition of claim 1 wherein the substrate comprises a metal oxide; a ceramic; a metal; an alloy; a zeolite; a polymer; a carbon-containing material or mixtures thereof.
3. The catalyst composition of claim 1 wherein the ultrafine particles comprise gold, copper, silver, platinum, palladium, rhodium, nickel, and other transition metals; iron; alloys of noble metals; metal oxides; and mixtures thereof.
4. A smoking article, comprising:
a rod of aerosol generating material
a filter element coupled to a first end of the rod; and
at least one catalyst composition comprising ultrafine particles the at least one catalyst composition being operative to convert carbon monoxide to carbon dioxide at temperatures below 150 C.
5. The smoking article of claim 4 wherein the catalyst composition is located within the filter element.
6. The smoking article of claim 5 wherein the filter element comprises carbon.
7. The smoking article of claim 6 wherein the filter element further comprises an adsorbent.
8. The smoking article of claim 4 wherein the catalyst composition is located within the rod of aerosol generating material.
9. The smoking article of claim 4 further comprising a heat source.

10. The smoking article of claim 9 wherein the catalyst composition is located adjacent the heat source.
11. The smoking article of claim 9 wherein the catalyst composition is located in the filter element.
12. The smoking article of claim 4, wherein the catalyst composition comprises a plurality of ultrafine particles positioned on at least one substrate.
13. The smoking article of claim 12, wherein the at least one substrate comprises at least one of cerium oxide (CeO_2), titanium dioxide (TiO_2), alumina (Al_2O_3), or mixtures thereof.
14. The smoking article of claim 13, wherein the at least one substrate comprises alumina (Al_2O_3).
15. The smoking article of claim 13 wherein the ultrafine particles comprise a noble metal.
16. The smoking article of claim 15, wherein the noble metal has an average particle size up to about 100 nanometers.
17. The smoking article of claim 16, wherein the noble metal has an average particle size up to about 10 nanometers.
18. The smoking article of claim 17, wherein the noble metal has an average particle size between about 2 and about 4 nanometers.
19. A method for facilitating the conversion of carbon monoxide to carbon dioxide in a smoking article, comprising incorporating at least one catalyst composition in a filter element of the smoking article, the at least one catalyst composition comprising:
 - at least one substrate; and
 - a plurality of ultrafine particles positioned on the at least one substrate.

20. The method of claim 19, wherein the at least one substrate comprises at least one of cerium oxide (CeO_2), titanium dioxide (TiO_2), alumina (Al_2O_3), or mixtures thereof.
21. The method of claim 19, wherein the at least one substrate comprises alumina (Al_2O_3).
22. The method of claim 21, wherein the ultrafine particles comprise gold.
23. An article of manufacture comprising a catalyst composition of claim 1.
24. A filter element comprising a catalyst composition of claim 1.